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A comparative Study on Outward FDI: Korea, Japan, China

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권 후 나

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Rhee Yeongseop

Submitting a master's thesis of International Commerce

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Graduate School of International Studies
Seoul National University
International Commerce Major

Kwon Hoona

Confirming the master's thesis written by
Kwon Hoona
August 2019

Chair	Cheong, Young-Rok	(Seal)
Vice Chair	Kim, Chong Sup	(Seal)
Examiner	Rhee Yeongseop	(Seal)

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Kwon Hoona

Abstract

Until now trade used to be the focus of the internationalization and the expansion of the market as well as business into other countries but there was a shift. The assumption of which trade takes place is when there is perfect competition and the resource endowment of capital and labor are the only factors that affect production, while all the other factors are immobile. As the true market is imperfect in real life and with the trend of globalization, the importance of Foreign Direct Investment (FDI) has increased. There being limited amounts of resources in a country, many firms are seek opportunities abroad to expand their business. Thus, this paper will deal upon the matter of the determinants of the trend of Outward FDI.

This study mainly focuses on the patterns of Outward Foreign Direct Investment (OFDI) in the East Asian region, focusing on Korea, Japan, and China. The paper is a comparative study on how the three countries differ and have similarities in their decisions when conducting FDI. The paper chose to deal with the 3 most developed

countries in the East Asian region because they have similar cultures and historical backgrounds. It is a well-known fact that the Korean Economy follows the Japanese economy with a gap of 10 years. To add on, China, despite its distinct political and territorial characteristics seems to be catching up showing similar patterns in their economic growth status with the other two countries.

This paper has used the STATA program to run several different regression models in order to differentiate the patterns in which the three countries conduct OFDI in a host country. The data will be collected based on the host countries of which FDI was performed. The determinants that were used as variables are the distance, GDP, population, GDP per capita, political risk (corruption level), natural resource endowment, and trade openness.

The results from the regression have shown that all three countries are positively correlated with GDP, GDP per capita, natural resource endowment. While it is negatively correlated with population and has shown insignificant results for Political risk. Thus, through this paper, the author would like to provide predictions of the Korean and Chinese economy and show that the three countries have similar investment patterns

[Keyword]: OFDI, FDI(Foreign Direct Investment), East Asia, Investment patterns

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Chapter 1. Introduction

1.1 background of the study

1.1.1 Definition of FDI

With the trend of globalization came the integration of the economy of all nations. Trade used to be the dominant source of capital exchange, which took up and still takes up a large portion of many countries' source of revenue. However, there was a shift with the integration and expansion of the global market, leading to a gradual and consistent increase in the amount of Foreign Direct Investment (FDI) among countries rather than focusing solely on trade as a means of transfer of payments or products. Unlike trade which is based on the presumption that the market it perfect, FDI assumes an imperfect market with no factor price equalization, or mobile input factors. So Foreign Direct Investment, which is more than just an exchange of shifting products to another country through export of import, can bring financial integration within nations and will a big role in facilitating this trend.

The International Monetary Fund defines 'FDI' as an investment, made to acquire a lasting interest in a firm operating in an economy other which of the investor

locates (IMF 2003). The intention for the investor's investment through FDI is to influence the firm in terms of management of the firm. In addition to equity participation, forms of non-equity investment and control, such as sub-contracting, management contract, turnkey agreement, franchising, licensing and product sharing are also considered as FDI. FDI can be distinguished from portfolio investments which is a form of investment by an investor merely to purchase equities of a foreign firms rather than to cast a voice on the management of the firm. To sum up, foreign direct investment can be through building factories, and providing machinery and equipment, while an indirect investment would be including portfolio investments.

In recent years, given rapid growth and change in global investment patterns, the definition has been broadened to include the acquisition of lasting management interest in a company or enterprise outside the investing firm’s home country(OECD 2008). It may take many forms, such as a direct acquisition of a foreign firm, construction of a facility, or investment in a joint venture or strategy alliance with a local firm dealing with input of technology, growing, and licensing. With a wider variety of forms, the impact of foreign investment is increasing and it is worthy of more attention.

1.1.2 Introduction on FDI trend

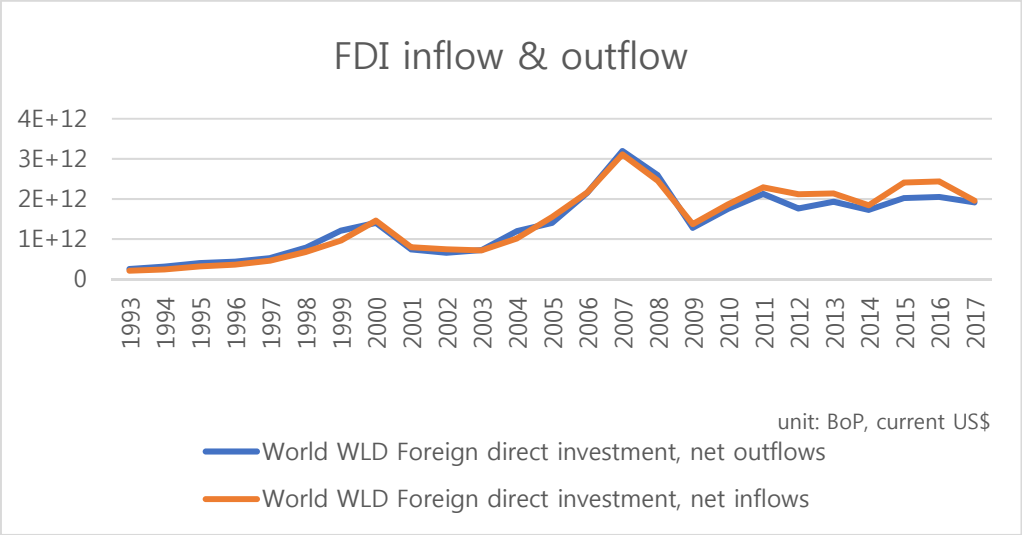
The total amount of world FDI flows have skyrocketed recently at the beginning of the early 2000s and have changed in their transformation of geographic distribution. Continuing economic liberalization and globalization in developing countries, and with the global financial crisis and euro zone crisis the FDI flow into the developing countries have increased which contributed in the total amount of FDI worldwide (Nayyar 2014). Moreover, FDI plays a major and growing role in global business along with trade providing Multinational enterprises (MNEs) with new markets, marketing channels, cheaper production facilities, access to new technology, products, skills and financing (Blaine 2009). From the perspective of the host country receiving the investment, the country has an advantage of that a strong impetus for economic development is provided. Dunning had noted that a series of new developments has transformed the activities of economic agents in the 1980s and 1990s (Dunning 1995). The world moved towards a new trajectory of market capitalism that could be explained through alliances, or relational and collective actions of the economic agents. In the case of the firms, they found more eclectic modes of creating wealth which was the beginning of foreign investment expanding by the developed nations.

The world total FDI inflows of the years 2015, 2016, and 2017 were $1.92 trillion, $1.87 trillion, and $1.43 trillion respectively (UNCTAD 2018). From Figure 1

we can see that the trend from the early 1990s until recently. The world FDI had reached its peak in 2007 and had dropped greatly because of the global financial crisis that had occurred starting in US, 2008. It has been recovering but not smoothly until there was another decline in 2017. The decline in 2017 was because of a slump in the flows of FDI toward developed countries as we can see from Figure 2, but we can see from that the decrease was rather subtle. (UNCTAD 2018). Overall, we can see that the FDI flow into the developed countries are still dominant and affect the world total FDI largely. However, we can see a gradual increase of the inflow of FDI into the developing countries from Figure 2 and can expect an increasing inflow of FDI towards the developing countries.

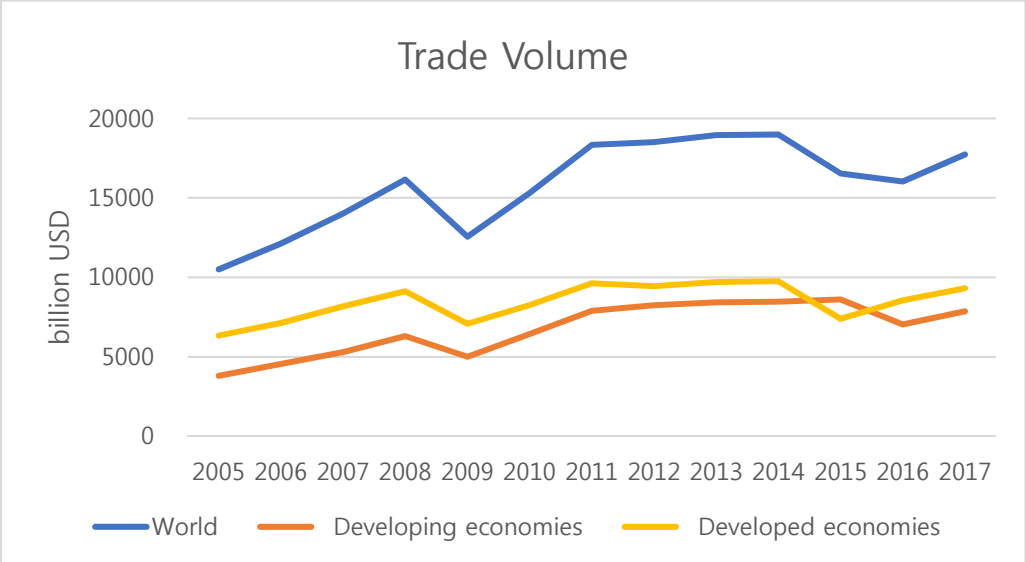
Recently, the emerging Asian economies have also joined the important players of OFDI in the global market. Thus, in order to understand the global economic trend of Korea, Japan, and China, this study would like to analyze their investment patterns abroad. (Gammeltoft et al.,2010).

Figure 1 World FDI flow.



Source: UNCTAD

Figure 2 World Trade Volume



Source: UNCTAD

1.2 objective of the study

FDI flows increased dramatically in the past 20 years increasing to a volume comparable to trade. Over the same time period, a dramatic proliferation of FDI theories were in addition to empirical FDI approaches showing the importance of FDI. However, there were many uncertainties dealing with FDI theories and empirical approaches creating notions that few FDI determinants are truly robust and show a close relation. Numerous empirical studies estimate only subsets of particular FDI theories to produce results that are often either inconclusive or outright contradictory(Chakrabarti 2001).

In addition to the increasing interest in FDI, this study focuses on Outward oriented FDI as there was a rapid increase in the outflow of investment. In the case of Korea, OFDI had exceeded inward FDI in 1990, but with the Asian financial crisis in 1997, there was a massive decrease in the following decade. So since 2006, OFDI has consistently been larger than inward FDI for Korea. In the case of Japan, available data from 1970 shows that OFDI has been larger than the inflow of FDI. Japan being one of the leading economies in the world, it has been making more investments abroad than receiving investments for over 5 decades. China has been one of the most rapidly growing economies and now is one of largest top5 economies. It had been attracting large investments from foreign

MNEs, but since 2015, the outflow of FDI has started to surpass the inflow of FDI.

This paper aims to provide a comparative interpretation on the determinants of outward FDI of the host countries Korea, Japan, and China. Korea, Japan, and China rank 12th, 2nd, and 3rd respectively in terms of the size and amount of outward FDI according to data from 2016 and 2017. By identifying the determinants that cause the foreign investment, this study will be able to provide a comprehensive understanding on the patterns that can be found in East Asian countries. Moreover, through the results of this study, the author would like to provide an insight on how the trend will change in the future for Korea and China. According to Kuznets, Korea is said to show economic patterns that is a decade behind Japan and employs similar development strategies to that of Japan such as export-orientated policies and a conglomerate-dominated industrial system like Zaibatsu and Chaebols (Kuznets 1988).

In addition, Korea, Japan and China located in East Asia was the focus of this study as they share a commonality that technological development and advancement played the leading role in enhancing economic development, along with the region's export orientation. A large part of East Asia's miraculous economic growth was stimulated by producing and exporting technologically sophisticated products(Petri 2012). When it comes to FDI, the flow of Asian FDI

patterns show investment from high-technology home economies to relatively low-technology host economies, however the overall world FDI pattern shows that high technology economies invest in other high technology economies. This is a distinct investment strategy found among East Asian nations as they invest in foreign countries to transfer technologies. They transfer their advanced technologies to use their technological assets even after their domestic production advantage wears off. Therefore, Asian FDI is attracted to nations with conditions for convenient technology transfer than economies of scale or factor price differences. This ‘‘Asian exceptionalism’’ turns out to reflect not only differences in the relative emphasis on vertical and horizontal FDI, but also differences in the determinants of FDI in Asia(Petri 2012).So this paper focuses on the 3 east Asian countries as they share this similarity of being driven to countries with a technology transfer-friendly environment, making them unique from other regions and nations(Petri 1988).

Also, China yet being a developing country, this study would like to predict the future patterns of the Chinese FDI pattern through the examination of the Korean and Japanese outward FDI patterns.

1.3 limitation of study

When selecting the countries for analysis, this study has used the data of the top

20 countries in which Korea, Japan, and China have invested abroad. Due to the quantity of data, this study has selectively chosen only 20 partners for analysis than interpreting all countries the three countries had invested in.

This study has excluded Cayman Island and Guernsey from the dataset despite the fact that they were one included in the top 20 countries in which the countries have invested largely in. The reason to the exclusion was that the invest toward Cayman Island and Guernsey were for purposes that do not match the purpose of this study. The investment was attracted merely for tax exemption and other transactional purposes so this study has put the two countries aside. Moreover, due to the lack of data regarding Taiwan, this study has excluded Taiwan from the analysis while Hong Kong was regarded as an individual state.

Hong Kong is one of the world's leading international financial center with a well-established international financial market which has been independent economically for decades(Guorong Jiang, Nancy Tang 2003). Moreover, Hong Kong has been one of the largest state the three countries have been investing in. Hong Kong was the 3rd, 14th, and 1st largest region Korea , Japan, and China respectively invested in for the time period of 11 years that was investigated in this study.

In terms of the yearly data that was used to measure the impacts on outward FDI, this study has used the corresponding information of the 5 variables for each year

rather than using the measurement of the preceding year. This study has used data from the year 2002 to 2012 of a total of 11 years and ran a regression on the top 20 countries for Korea, Japan, and China respectively according to the sum of total amount of outward FDI of those eleven years. In the case of Korea, 85.783% of the total amount of outward investment that was done can be explained by the top 20 countries. For Japan of the total OFDI, 92.142% can be covered by the top 20 countries. Lastly, Chinese OFDI of the top 20 countries takes up 74.234% from the total investment made. Overall 84% of the total OFDI of the three countries can be explained by the 20 largest countries in which investment is made. Thus, as the Outward FDI of the top 20 countries for the three countries of interest can explain the majority of OFDI, it was reasonable to use data only of the 20 host countries.

Chapter 2. Review of Literature

2.1 theories of FDI

2.1.0 The early Neoclassical and Portfolio Investment Approaches

Despite the fact that his Ph.D. dissertation being unpublished immediately, Stephen Hymer has been one of the first to differentiate portfolio long-term investment from foreign investment (Hymer 1976). He tried to show that the theory of international capital movement could be used upon portfolio investment while a theory of industrial or firm relationship should be used for foreign direct investment (Mira Wilkins 1977). He points out that MNEs export equity and import debt capital in portfolio investment while most direct investment is undertaken by nonfinancial companies showing nonrandom scatter among industrial sectors (Parry 1977). Firms invest based on two assumptions according to Hymer(Carlos Diaz Alejandro, Jagdish N. Bhagwati 1977). First, in terms of horizontal investment in an oligopolistic market, a firm tries to extinguish competition with its rivals and for vertical investment, the aims are to avoid bilateral monopoly. Second, an MNE conducting foreign investment has strategic advantage in either factor cost, production efficiency, distribution system, or product differentiation. These two explanations of extinguishing competition and

exploiting firm-specific advantage shows how firms may intend on investing abroad(Richard Caves 1977).

2.1.1 Dunning's Eclectic Paradigm (OLI Paradigm)

The most prominent theory on the FDI would be Dunning's eclectic paradigm on internationalization theory (Dunning 1980). Dunning theorizes the determinants of multinational enterprises (MNE) activities showing the collapse of boundaries among firms, countries, and markets at a global level. The eclectic or OLI, paradigm is a theory which provides a three-tiered framework an MNE follows when determining to invest in foreign markets where they can make benefits. Also the framework shows why some particular firms go abroad whilst the other firms do not(J. Peter Neary 2009). The theory is based on the assumption that an institute will avoid transactions in the open market when internal transactions carry lower costs than external transactions. The OLI consists of 3 main components which are Ownership advantages, Location advantages, and Internalization advantages.

The Ownership advantage encompasses the specific competitive advantage of a firm that leads the firm to invest abroad and attempt foreign production. These competitive advantages may arise either from the firm's privileged ownership of, or access to, a set of income-generating assets,8 or from their ability to co-

ordinate these assets with other assets across national boundaries in a way that benefits them relative to their competitors, or potential competitors.

The Location advantage refers to the particular advantages that an MNE can take according to characteristic of the host country. The host country may have bountiful natural or other resources, beneficial institution policies, and regulations related to the revenue and production costs. These locational benefits another country can provide for the MNEs that are in need of them induces them to the invest in foreign countries.

Lastly, Internalization advantages are the advantages an MNE has in terms of organizing and securing their competitive advantage. Internalization advantages can be associated with the transfer of ownership advantages across national boundaries within their own organization affecting the way a firm does its business in the host country. Moreover, they can show why MNEs carry on their business expansion abroad despite the transaction cost that occurs.

Thus, when all three conditions are satisfied, the firm will conduct foreign direct investment in another country as it finds it profitable to do its business abroad. Dunning's eclectic paradigm is used by a firm to evaluate the potentials a host country can have to determine the location or the feasibility of foreign investment (Dunning 2001).

2.1.2 IDP Theory (Investment Development Path)

The Investment Development Path or cycle theory was introduced to extend and reconfigure Dunning's eclectic paradigm. FDI develops through a path that expresses a dynamic and intertemporal relationship between an economy's level of development. The basic hypothesis of the IDP theory is that with the development of a country, changes may occur in the configuration and OLI advantages of an MNE willing to invest abroad. Moreover, the theory makes it possible to identify the effects on the trajectory of the country's development and conditions that cause the change(Cantwell, John, Narula 2003).

Dunning and Narula provides some stages a country may go through during their development (Fonseca, Mendonça, Passos 2007). First, the country in which the firm is located is assumed to have no or small amounts of inward or outward investment. Most countries in this stage are going through pre-industrialization, and country attracts FDI from foreign firms that seek natural resources.

Then in the second stage, with the dynamic nature taken into consideration, a country becomes the receiver of inward FDI while its Net Outward Inward (NOI) position decreases. As the market opens up to foreign investors, the infrastructure of the of the home firm develops allowing the home firm to improve their ownership advantage making it possible for the firms to eventually invest in foreign countries nearby, also known as market-seeking FDI.

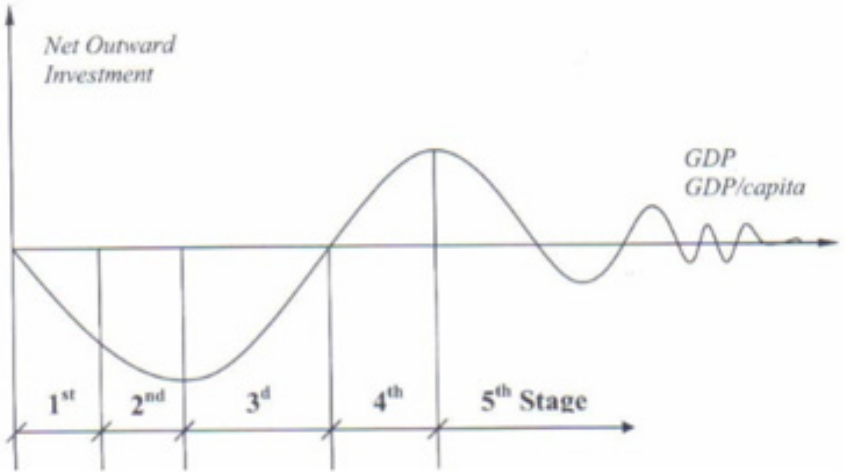
In the third stage as we can see from the Figure 3 a country matures and develops, showing growth in their NOI position but the inward FDI is still larger than outward FDI. In the home market, competition increases and the domestic firms form their own advantages thereby enabling the domestic firms (now MNEs) to invest abroad and countries in this stage can be seen as being in the developing stage.

For the Fourth stage, MNEs invest in firms or countries with a similar level of development. Countries in this stage are seen as a developed country measured by the level of GDP per capita, structural development, and economic social infrastructure. The NOI exceeds 0 meaning that the outward FDI is larger than the inward FDI, the country now becomes a net investor with a NOI position

Countries at the final stage are developed countries that have a NOI position that fluctuates closely around zero which shows they have large amounts of both inward and outward FDI. These patterns are shown as the factor endowment, technologies, labor qualification, etc. are similar among the economic structures of developed countries. NOI is no longer relevant as it may change according to external factors the short-term evolution of exchange rates and economic cycles(Trufin Ovidiu Serafim 2016). In addition, FDI starts to depend more on the localization strategies of the and the technological and organizational capacities of the MNEs.

It had been demonstrated that the dynamic relationship between foreign direct investment and the level of development of a host country can be reflected by the investment development path (IDP), (Trufin Ovidiu Serafim 2016). Although there are some limitations with the IDP model, it can provide some indicative points rather than categorical specifications(Trufin Ovidiu Serafim 2016).

Figure 3 The pattern of the Investment Development Path



Source: Dunning and Narula (1996)

2.1.3 Modern FDI model

Helpman(Helpman 1984) introduced a modern view on FDI in terms of the factor proportions theory and separated the form of investment of a firm into two categories, one of which was appropriate for skill-abundant countries and the

other better carried out in skill-scarce countries. Moreover, Markusen (Markusen 1984)looked at FDI as a method in which a firm could achieve multi-plant economies while avoiding trade costs. This modern approach by the two later developed into the well-known vertical and horizontal FDI. Markusen(Markusen 2002) defined vertical FDI as "investments that geographically fragment the production process by stages of production" and horizontal FDI as "foreign production of products and services roughly similar to those that the firm produces for its own market." This approach was also developed and promoted the "knowledge–capital" model by integrating both the vertical and horizontal motives of FDI(Markusen 1984). The knowledge–capital model consists of over 40 equations using Rutherford's mixed complementarity problem solving program, GAMS. The model was able to it explain the allocative and distributive effects of MNEs using the partial and general equilibrium models.

2.1.4 Production life cycle theory of FDI

Vernon has developed the production life cycle in regards of firms in the United States dealing with the timing of innovation, the effects of scale economies, and the roles of ignorance and uncertainty in influencing trade patterns than the comparative advantages (Vernon 1966). The production life cycle theory consists of four stages including innovation(introduction), growth, maturity, and decline (Denisia et al. 1998). In the beginning stage firms introduce new innovative

products for local needs and these products can be exported to countries with similar needs, preferences or incomes. Then in the second growth stage, a copy product is made in another location and sold in the home country because of cost of production. In the maturity stage the industry starts to contract and the firm producing at the lowest cost survives due to saturation. For the last declining stage, where the sales decrease and the product discontinue to be produced while the country imports the good from another less developed country. The production life cycle theory was meaningful in that a dynamic spectrum was added with the extension of developed and developing countries. However, there were some shortages as the theory was developed in the 1960s and the study was limited to the United States(Cho, Suh, and Kang 2007).

2.1.5 Imbalance Theory of FDI

Introduced by Moon and Roehl(Hwy Chang Moon and Roehl 2001), the imbalance theory tries to analyze the foreign investment in terms of imbalance rather than the advantages such as ownership-specific advantages a firm may have. Moreover, the imbalance theory works on explaining both directions, upward and downward, of FDI flowing form developed to developing and developing to developed nations. The imbalance theory encompasses upward FDI from the less developed nations to the more developed nations which can

not simply be explained with the ownership advantage (H. Moon 2015).

The imbalance theory is based on the imbalance or the difference between the level of the optimal and actual input and output factor when the market fails. When a firm does not have ownership advantages that come from better technology or capital it may still invest abroad to overcome its disadvantages in the domestic market. The imbalance between the optimal and actual level of output lets the firm to seek a market abroad while reinforcing and forming a foundation for assets and find complementary assets. Simply, there are steps where the critical factor (technology or capital) determines the optimal output, then the optimal output determines the optimal input which identifies the amount of surplus factor which is the difference between the actual and optimal amount of output factor. This surplus factor then motivates the firm to invest in a foreign country.

2.1.6 Diamond model

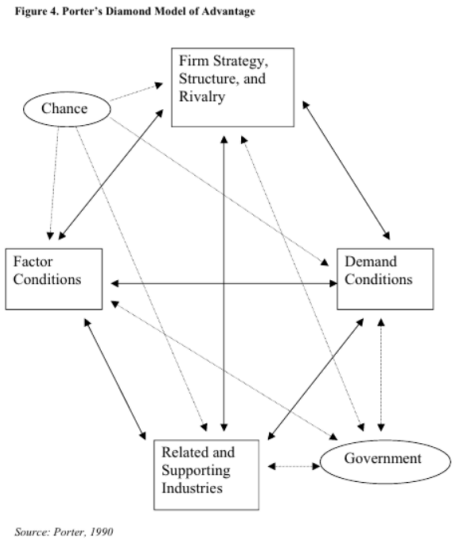
Porter (Porter 1990) introduced the diamond theory to show the relationship between 4 factors related to competitiveness of an industry. The diamond model illustrates the four attributes that are important for identifying the competitiveness of a country which are factor condition; demand condition; firm strategy, structure, and rivalry; and related and supporting industries.

Factor conditions are mainly the input conditions in respect of the absolute advantage and factor-proportions theory which includes infrastructure, and physical and human resources(John D. Daniels 2001). Demand conditions refer to the home market conditions or the demands for the particular service or product in a particular country(H. Moon 2016). Firm strategy, structure, and rivalry include the macro conditions controlled by the government and regulations as well as the micro conditions which is the industry structure that forms the domestic rivalry. Rivalry stimulates firms to develop new technologies, promote value creation, and increase labor productivity in clusters. Finally, the related and supporting industries may assist a firm with the international competitiveness the supplier already has. The supporting industry within the cluster will be able to enhance innovation and internationalization which can contribute to productivity growth.

In addition to the four conditions, there are two exogenous variables; chance, and government. Chance refers to events that would influence the world market such as financial crises, war breakouts, natural disasters, technology breakthroughs, or luck, which would eventually cause changes within the business of the firm. The government factor may affect the firm through policies and regulations. The two exogenous variables cannot be managed by a firm but has great impact on the competitiveness of a firm.

Porter's Diamond model provides useful implications however it was home country based so Moon, Rugman, and Verbeke have extended the model to the Generalized Double Diamond Model(GDD) which incorporates multinational activities(H Chang Moon, Rugman, and Verbeke 1998). In these multinational actives of the GDD, outward and inward FDI is included. National competitiveness is referred to as the capability of the to gain sustainable added value in another country in this case. The two largest differences of the GDD to the original Diamond model is that the values added can come from either the domestic or a foreign source and that other than clustering it may be necessary for a firm to scatter across many countries.

Figure 4 Porter's Diamond Model of Advantage



Source: Porter (1990)

2.2 Studies on FDI determinants.

There are many different studies with different interpretations to figure out the factors that contribute in identifying the determinants of FDI. First, MNEs that invest abroad usually are affected by the size of the economy or economic growth level of the country they are investing in(Wheeler and Mody 8888). Unlike foreign direct investment, trade can be affected by the tariff or trade barriers of the host country. For countries with high trade barriers and tariff rates, MNEs prefer to directly invest showing that the tariff rate can indirectly affect FDI(Tae Young Jun 2003). Moreover, the tax system within the host country or government policies for attracting investment can affect the FDI of a firm. To add on, Moran had mentioned the importance of considering the elasticity of the labor market(Moran 1998). When the labor force and labor market of the host country have shown more elastic features, there was a tendency of more foreign investment inflow.

Economic literature specifies a broad array of FDI determinants, for transition economies and for advanced countries. Studies have verified that the local market size, which can be expressed by the GDP or population of a host country, has a positive and statistically significant effect on FDI performance(Tokunaga and Iwasaki 2017).

Other than the that, there were studies exploring the relationship between

institutional factors and FDI attractiveness. These studies that have shown a correlation in fields such as corruption rate, openness, political stability, investment conditions, corruption, tax rates and cultural distance affect outward investment(Bailey 2018).

2.3 Literature review on Korea, China, Japan

2.3.1 Overview on Korea FDI

According to Kwon, the reasons for Korean firms to invest abroad were labor and management conditions(54.1%), geographical and location conditions for building factories(22.8%), financial conditions(10.3%), and administration conditions(6.0%) (Kwon and Chun 2010). Moreover, the Korea Chamber of Commerce and Industry (KCCI), the firms that invest abroad are more satisfied with the investment abroad compared to the domestic investment by approximately 20%. The authors have used the determinants of business level, tax, tariff, wage, patents, gdp, and distance in the study and it showed that business, economic size, were positively correlated while wage and distance were negatively correlated.

Park, Shin, and Lee(Park, Shin, and Lee 2016) have conducted a study on the Outward FDI in respect of third country effects. There were many variables used in this model which were GDP, population, total capital, number of internet users,

political risk, trade openness, number of patents, and potential of neighboring countries. This study utilized the standard gravity distance and spatial lag weighting matrix for specification on the basis of a log-linear model. The results of the paper have shown that the third country effects are only partly relative in the case of Korean outward FDI with positive correlations with GDP, population, total capital, and political risk. OFDI decisions are highly affected by the market potential of the surrounding countries meaning that the purpose for investing abroad is to pursue an export-platform or practice complex FDI.

Lee, Kim, and Lee have used a gravity equation to analyze the effect of trade on FDI(Lee, Jaimin, Kim, Dongwook, Lee 2017). This paper has focused on the amount of trade and tested export, Free Trade Agreements(FTA), FDI, and distance. This paper has used the fixed effect instrumental variable and random effect instrumental variables with a lag of 1 year. The results of the paper have shown that trade was significantly and positively correlated with GDP and FDI while it was negatively related to whether the two countries had a FTA and the distance among the two countries. The fact that the countries includes were mostly nations that shared FTA may have been the reason to the negative output.

Jun has looked into the Korean MNE's foreign direct investment influenced by tax and nontax factors(Tae Young Jun 2003). There were 7 tax factors including corporate tax rate, VAT(sales tax), indirect foreign tax credit, tax holidays, tariff

rate, withholding tax rate on dividends, and accelerated depreciation and 6 nontax variables such as electricity, GDP, inflation, exchange rate, distance, and regulation control. The outcomes of the regression analysis have proven that GDP and distance to host countries play very important roles in the FDI decision-making of Korean MNEs. In addition, we have found that FDI activities decrease as withholding tax rate, corporate tax rate, and tariff rate of host countries increase. On the contrary, offering benefits of tax holidays are positively related with foreign investment decisions of Korean enterprises.

A comparative study on ASEAN nations, Korea's outward FDI was positively correlated to GNI, Interest Rate, Exchange rate, Technology, and Openness of the economy while it was negatively correlated to human capital(Ahmad, Draz, and Yang 2018).

2.3.2 Japan empirical evidence on the determinant of FDI

Fujiwara has shown evidence on the welfare effect of trade and FDI liberalization in a general oligopolistic equilibrium where firms have significant power in their own market, and that they exploit this market power strategically. FDI industries are more efficient than exporting. Trade liberalization raises the equilibrium wage, and FDI liberalization lowers it. Trade liberalization improves welfare- welfare effect. FDI liberalization improves welfare. Simultaneous liberalization of trade

and FDI improves welfare.

Farrell, Gaston, and Strum have looked into the determinants of the Japanese foreign determinants from the year 1984 to 1998. They had conducted a panel study according to industry and country. There were 9 industries from 15 countries that were tested with 7 independent variables of GDP, export, import, labor cost, antidumping investigation, interest rate, and exchange rate(Farrell, Gaston, and Sturm 2004). GDP was used to measure the market size which had a positive strong while antidumping investigation also showed a positive correlation. However, the other variables that were tested had shown unambiguous results.

Fujikawa and Watanabe (2004)(Fujikawa, Shimoda, and Watanabe 2006) investigated the impact of outward FDI on the employment of Japan from 1990 to 1999. This period was an early stage of Japan's foreign expansion, so the amount of unemployment had increased continuously with the rapid growth of Japan's outward FDI.

A study was conducted on the ASEAN(Association of Southeast Asian Nations) countries to identify the factors that drive outward FDI(Ahmad, Draz, and Yang 2018). The paper used GNI(Gross National Income), Interest Rate, Exchange rate, Human capital, Technology, and Openness of the economy as independent variables for China, India, Japan, Korea, etc. the results have shown significant

results for mostly all the tested variables. However, the correlation with the independent variables and outward FDI have shown different patterns according to country from ASEAN. In the case of Japan, exchange rate, GNI, and human capital had a negative correlation while interest rate, openness of the host economy, and technological level were positively correlated.

Lee(Lee 2010) examined the short-run and long-run dynamic interactions of the Japanese outward FDI and GDP per capita using the bivariate and multivariate framework. The results from his study have shown that GDP per capita had short-run effects on outward FDI. However, after controlling the country specific effect by adopting Japanese domestic investment and openness as control variables in a multivariate framework, the results have presented that outward FDI had positive effects on GDP per capita only in the long-run.

2.3.3 China empirical evidence on the determinant of FDI

According to Kolstad, China's outward FDI can be explained by the corruption level or the institutional level and natural resource of the host country(Kolstad and Wiig 2012). The measurement used to identify the institution of the host countries was the Rule of Law index provided by from the World Bank Institute (WBI) Governance Indicators. Considering that most of the firms in China that invest abroad are predominantly state-owned Enterprises (SOEs), the paper has

examined that Chinese firms are attracted to nations with low institutional levels. The investment decisions of Chinese firms showed that their investment is determined also by political objectives, and do not focus only on profit-maximization as in the case of private owned multinational corporations in other countries. To measure the amount of natural resources of countries, they have used the measurement of the share of ores and metals exports in total merchandise exports.

Ramasamy, Yeung, and Laforet have also conducted a research on the location choice and firm ownership of China's outward FDI (Ramasamy, Yeung, and Laforet 2012). The authors have ran regressions to test whether Chinese outward FDI is attracted to locations with large supply of natural resources, politically risky, higher ownership advantage, and a high technological level. This paper dealt with the ownership structure of the internationalizing Chinese firm which is a unique characteristic of the Chinese firms. Many Chinese MNEs are state owned enterprises which leads to some distinct factors China is driven to when investing abroad. Another interesting variable was the number of Chinese citizens living in the host country. The outcomes have indicated that a sizeable Chinese population in the host country shows significant and positive relations with the amount of investment.

Kolstad and Wiig have performed a study on Chinese outward FDI determinants

of natural resources and institution levels (Kolstad and Wiig 2012). Unlike the previous studies they have come up with improved results that were able to prove that the natural resources were positively correlated to outward FDI while the Chinese firms were attracted to nations with bad institution or high political risks. Buckley et al. had also shown that Chinese FDI was affected by the institutional factors(Buckley, Peter J; Clegg, L Jeremy; Cross, Adam R; Liu, Xin; Voss 2007). They have shown that Chinese firms are attracted to host countries that are politically risky and have cultural proximity. In addition, Chinese FDI was had a positive correlation with the market size and natural resource endowment however, it had a negative correlation with geographic proximity(distance) of the host country. Cheung and Qian have done a study on the empirical determinants of Chinese outward FDI toward both developed and developing countries(Cheung and Qian 2009). Chinese foreign investment has both market-seeking and resource-seeking motives for both the developing and developed country. This paper has set the independent determinants to be GDP, Wage, Raw material, and Risk of the host country. This paper has expected the risk variable and natural resource(raw material)to be positive however, there was no significant result derived for both factors.

The study on ASEAN countries has shown some interesting results for China. All the variables tested including GNI, Interest Rate, Exchange rate, Human capital,

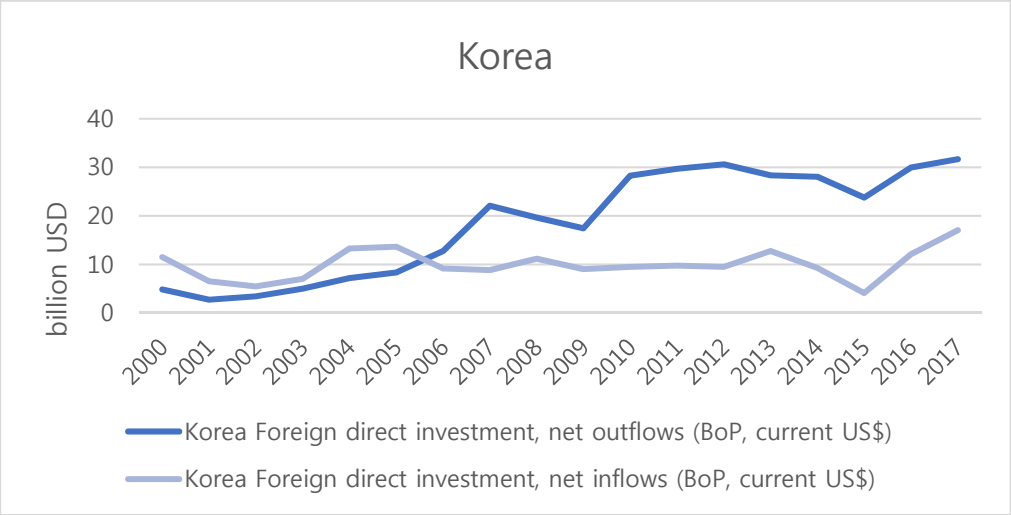
Technology, and Openness of the economy were positively correlated with outward FDI(Ahmad, Draz, and Yang 2018).

Chapter 3. Overview on Foreign direct investment and economy of Korea, Japan, and China

3.1 Trend in FDI inflow/ outflow in Korea

To start with, I would like to look into the FDI trend of the Korea, Japan, and China Figure 5 shows that the inward and outward FDI have both increased gradually since 2000.. The year 2005 was the turning point for Korea as the amount of outward FDI started to surpass that of the inward FDI. Since then the inward and outward FDI trends have shown similar patterns in their increase and decrease, which shows that the amount of foreign investment was affected by external economic shocks rather than the internal shocks within the Korean economy.

Figure 5 Korea FDI flow

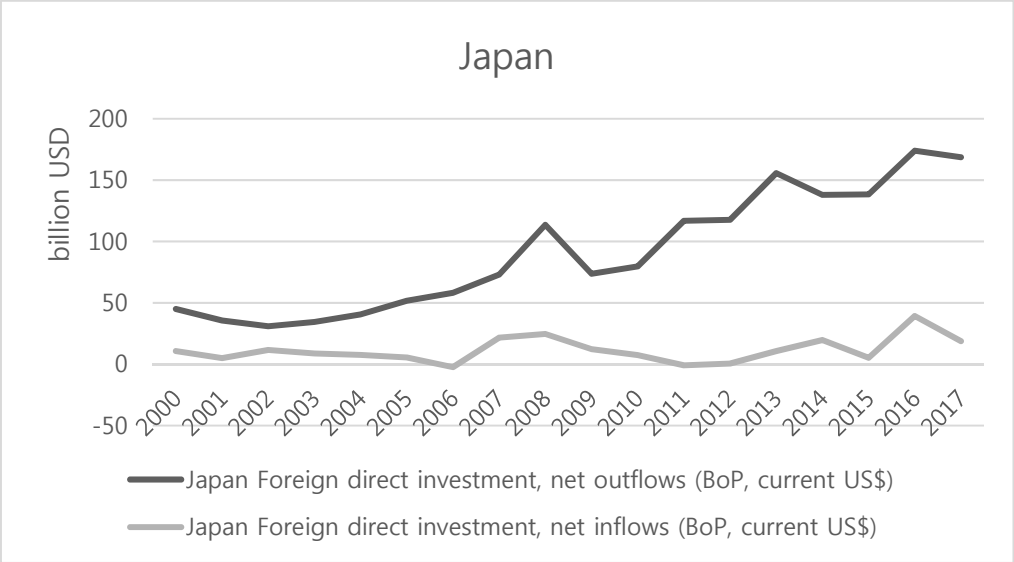


Source: UNCTAD

3.2 Trend in FDI inflow/outflow in Japan

Taking into consideration that Japan had been a developed country leading the global economy, we can observe that the inward FDI has consistently been lower than the outward FDI. The following Figure 6 indicates that the outward FDI of Japan in increasing steadily while the inward FDI fluctuates and shows a decreasing trend. We can observe the increasing gap in the difference of outward and inward FDI for Japan. We can also see that considering its economic position among the OECD countries it has a relatively low amount of foreign investment, even compared to Korea its FDI is lower(OECD 2017).

Figure 6 Japan FDI flow



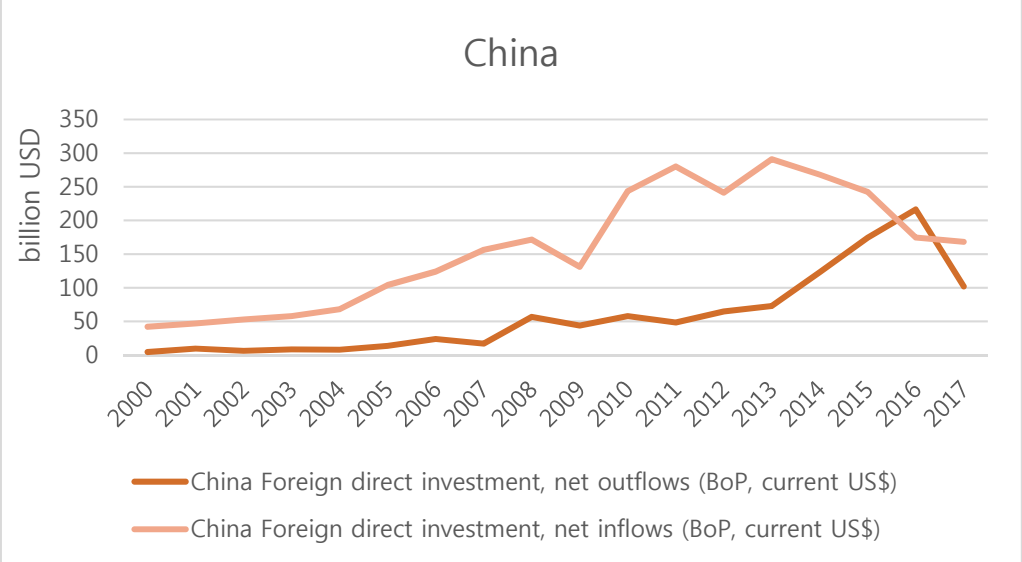
Source: UNCTAD

3.3 Trend in FDI inflow/outflow in China

Lastly, in the case of Chinese FDI, we can detect from Figure 7 that its overall inward and outward investment abroad is increaseing. The inflow of FDI exceeds that of the outward FDI in the case of China. Regarding the fact that China is still considered as a developing nation, we can understand this trend. In the recent years, the outward FDI has grown by over 20 times that of the year 2000 and almost sextuples compared to the amount 10 years ago. The reason to the China's outbound foreign direct investment (ODI) showing a big turnaround as of its strong growth momentum in 2016 was because of the Chinese national

authorities' restrictive measures to curb capital from outflowing(Huang and Xia 2018). Recently the inward FDI is shrinking and we can predict that in the near future the outward FDI may start to exceed the inward FDI.

Figure 7 China FDI flow



Source: UNCTAD

Chapter 4. Determinants of outward FDI in 3

4.1 data source and methodology

4.1.1 source of methodology

Table1 Source of Data

Variable	Source
Trade (% of GDP)	the World Bank World Development Indicators
GDP per (current US$)	the World Bank World Development Indicators
population	the World Bank World Development Indicators
GDP per capita (current US$)	the World Bank World Development Indicators
Natural resource	the World Bank World Development Indicators on Fuels, ores and metals exports as a share of GDP
Institution	the WBI governance indices measure control of corruption, political stability, government effectiveness, and regulatory quality(wgi)
Foreign direct investment, net outflows (BoP, current US$)	United Nations Conference on Trade and Development (bilateral FDI data)

In the process of specifying select the independent variables that may be related to the outward FDI, I have referred to some different papers to include determinants that would be able to reflect all three countries Korea, Japan, and China. First, Kwon and Chul(Kwon and Chun 2010) have analyzed the Korean

outward FDI determinants. To show the size of the economy of the host country, this study has chosen ‘gdp per capita’. Natural resources was selected as a independent variable which was the sum of fuels, ores and metals exports as share of GDP to show whether the host country was abundant in natural resources. This variable can show if the home country was conducting foreign direct investment in terms of resource-extraction FDI(Council and Trade, n.d.)

For the independent variable institutions, this study has used the Rule of Law index provided by from the World Bank Institute (WBI) Governance Indicators referring to a previous study by Kolstad as WBI indices have greater coverage of countries compared to other indices like those from the PRS group (Kolstad and Wiig 2012). The Rule of Law index measures ‘‘the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence’’(Kaufmann 2008).

4.1.2 methodology

Equation1>

$$\text{Outward FDI} = f(\text{GDP}, \text{POPULATION}, \text{TRADE}, \text{NATURAL RESOURCE}, \text{INSTITUTION})$$

Equation2>

$$\text{Outward FDI} = f(\text{GDP PER CAPITA}, \text{TRADE}, \text{NATURAL RESOURCE}, \text{INSTITUTION})$$

This study has identified the top 20 countries in which the three countries Korea, Japan, and China have invested abroad respectively. The countries or territories Cayman Island excluded as they had different reasonings for being invested. Taiwan was exempted due to the lack of data because of the issue of it being a single nation or a province of China. Hongkong was also excluded as it was difficult to consider it a single state despite the fact that it has a separate economy from China.

4.1.3 Expected results

Table2a Expected results

Variable	Korea	Japan	China
GDP (current US$)	positive	positive	positive
Population	negative	negative	negative
Trade (% of GDP)	positive	positive	positive
Natural resource	positive	positive	positive
Institution	positive	positive	negative

In this study, five variables were first tested to identify the correlation with

Outward FDI. GDP and population were used as a measurement of the market size of the host country. The expected outcomes are that the three countries of interest are attracted to countries that have a larger economy. Then, trade was expected to have a positive correlation with OFDI. Larger trade volumes show that there is a better understanding of the host country and its investment conditions. For natural resources, it is expected for the three countries to be attracted to nations with higher natural resource deposits. Lastly, Institutions measuring the political stability or security of the nation is expected to show conflicting results among Korea and Japan, and China. Each country is expected to be attracted to nations that share similar institution levels, meaning that Korea and Japan will have a positive correlation while China is expected to have a negative correlation.

4.1.4 Expected results

Table2b Expected results

Variable	Korea	Japan	China
Trade (% of GDP)	positive	positive	positive
GDP per capita (current US$)	positive	positive	positive
Natural resource	positive	positive	positive
Institution	positive	positive	negative

After testing the first model with GDP, population, trade, natural resources, and institutions, another model was tested replacing GDP and population with GDP per capita. As GDP per capita is defined by GDP and population, it was anticipated that GDP per capita would show positive results. GDP per capita was tested to draw the conclusion that not only the overall size of the host market can determine the investment volume. GDP per capita representing the actual purchasing power or consumption ability of the people, could also be an important factor that determines the investment made by Korea, Japan, and China. Thus, GDP per capita was tested with trade, natural resources, and institution.

4.2 Hypothesis

Hypothesis 1: Outward FDI will have a **positive** relationship with **GDP** for all 3 countries.

Hypothesis 2: Outward FDI will have a **negative** relationship with **population** for all 3 countries.

Hypothesis 3: Outward FDI will have a **positive** relationship with **GDP per capita** for all 3 countries.

Hypothesis 4: Outward FDI will have a **positive** relationship with **Trade** for all three countries.

Hypothesis 5:Outward FDI will have a **positive** relationship with **Natural**

resources for all 3 countries.

Hypothesis 6a:Outward FDI will have a **positive** correlation with **Institution**(political risk) for Korea.

Hypothesis 6b:Outward FDI will have a **positive** correlation with **Institution**(political risk) for Japan.

Hypothesis 6c:Outward FDI will have a **negative** correlation with **Institution**(political risk) for China.

4.3 Empirical results

4.3.1 Correlation Analysis

In this study, panel data according to year and host country was used to run a regression for South East Asian countries Korea, Japan, and China. Thus the data has both the characteristics of cross-sectional and time series data which can lead to having a higher possibility of the violating the assumption of the error term. So to control heterogeneity, the Fixed Effects model for the error-component model was used and the F-test, Breusch-Pagan LM (Lagrangian Multiplier) test, Likelihood-ratio test, and Hausman test was conducted in this order to control heterogeneity of statistical errors

The results of the F-test where all host countries of Korea, Japan, and, China were included, the F-value was 39.06 and was rejected at the 1% level. Thus, this

shows that the Fixed Value model is more significant compared to the Pooled OLS model.

Next, the results form Breusch and Pagan's LM test and Likelihood-ratio test both rejected the null hypothesis at 1% level. This shows that the Random Effects model is more appropriate compared to the Pooled OLS.

Lastly, to determine whether the Fixed Effects model or the Random Effects model is more appropriate for this study, the Hausman test was conducted. The null hypothesis from the Hausman test was rejected, verifying that the Fixed Effects model is the most suitable model for this panel regression.

Moreover, in this study, Winsorizing was used at 1% level for the dependent variable l_fdi. When examining the regularity of the variables without removing the outliers, we found that the skewness deviates to the lower end and the kurtosis was considerably high.

As a result of examining the regularity of the variables that were not removed, we found that the skewness deviates in a certain direction and the kurtosis was considerably high

With such conditions, it is difficult to run a regression which assumes normality. Thus, to prevent such outliers from affecting the result of the regression, Winsoring was performed to reduce distortion and attain normality within the data.

4.3.2 Descriptive statistics

Table 3. Descriptive Statistics

Country	Variable	*Obs*	*Mean*	*StdDev*	*min*	*p50*	*max*
1.All Country	*1-1.l_fdi*	720	23.127	2.260	17.164	23.513	26.564
	1-2.l_gdp	720	26.923	1.791	21.057	25.723	30.446
	1-3.l_population	720	17.526	1.736	13.008	17.017	21.029
	1-4.l_gdpper	720	9.403	1.472	6.726	10.056	11.015
	1-5.l_trade	720	4.412	0.758	3.210	4.219	6.018
	1-6.l_naturalresource	720	2.920	2.257	-0.973	2.611	10.719
	1-7.institution	720	0.569	1.167	-0.410	0.790	1.983
2.Korea	*2-1.l_fdi*	240	23.464	2.024	15.301	23.619	27.114
	2-2.l_gdp	240	27.194	1.533	24.280	27.321	30.373
	2-3.l_population	240	17.817	1.665	15.219	18.192	21.019
	2-4.l_gdpper	240	9.393	1.394	6.899	9.870	10.868
	2-5.l_trade	240	4.383	0.785	3.095	4.190	6.065
	2-6.l_naturalresource	240	2.565	1.065	-0.008	2.600	4.432
	2-7.institution	240	0.591	1.145	-1.425	0.570	1.970
3.Japen	*3-1.l_fdi*	240	23.579	1.719	20.250	23.572	26.581
	3-2.l_gdp	240	27.187	1.394	24.760	27.238	29.893
	3-3.l_population	240	17.79673	1.617646	15.23011	18.034	20.969
	3-4.l_gdpper	240	9.502	1.447	6.899	10.232	11.089
	3-5.l_trade	240	4.468	0.778	3.111	4.278	6.065
	3-6.l_naturalresource	240	2.428	0.714	1.288	2.393	3.657
	3-7.institution	240	0.728	1.117	-1.624	1.330	1.970

4.China	*4-1.l_fdi*	240	22.337	3.036	15.942	23.347	25.997
	4-2.l_gdp	240	26.688	1.436	24.771	26.671	28.896
	4-3.l_population	240	17.194	1.363	15.185	17.253	19.572
	4-4.l_gdpper	240	9.314	1.574	6.381	10.065	11.089
	4-5.l_trade	240	4.384	0.711	3.425	4.189	5.923
	4-6.l_naturalresource	240	3.766	4.993	-4.200	2.840	24.068
	4-7.institution	240	0.389	1.240	1.820	0.470	2.010

Table3 shows the descriptive statistics of the dependent variable and independent variables that was used in this study for Korea, Japan, and China. Except for the independent variable GDP (*l_gdp*), population(*l_population*), GDP per capita(*l_gdpper*), institution(*institution*), all variables including FDI(*l_fdi*), trade(*l_trade*), and natural resources(*l_naturalresource*) are in natural logarithms. The problem of the size effects among the variables occurred, which led to a considerably small coefficient. Thus by taking the natural log of the variables, this study was able to control the size of the coefficients.

In the case of l_fdi, the average was found to be 23.127, Japan being 23.579 as the highest and China 22.337 being the lowest. Above this Korea has shown highest average statistics for GDP (l_gdp) with a value of 27.194 and population(l_population) with 17.817. Japan has shown highest values for GDP per capita(l_gdpper), trade(l_trade), and institution(institution) while China has shown the lowest. For institutions, China has shown a considerably low value

considering its political regime and market protectionist policies. In the case of natural resources(l_naturalresource), China has shown the highest while Japan has shown the lowest, meaning that Chinese firms have the strongest tendency to conduct resource seeking FDI while Japan has the least.

4.3.3 Correlation Coefficients

Table 4 shows the correlation coefficients among the variables. The results show that Korea and Japan independent variable l_fdi and l_trade have shown a negative correlation at the 1% from Korea while the result was insignificant for Japan. For l_naturalresources of Korea and Japan, there was a negative correlation at the 1% and 10% level respectively. However, in China, the dependent variable l_fdi has shown a positive correlation with the independent variable l_trade and l_naturalresource at 1% and 10% level respectively.

Table4 Correlation Coefficient

		1-1	1-2	1-3	1-4	1-5	1-6	1-7	2-1	2-2	2-3	2-4	2-5	2-6	2-7	3-1	3-2	3-3	3-4	3-5	3-6	3-7	4-1	4-2	4-3	4-4	4-5	4-6	4-7
1. All Country	*1-1. l_fdi*	1																											
	1-2. l_gdp	0.7549***	1																										
	1-3. l_population	0.1348***	0.6242***	1																									
	1-3. l_gdpper	0.7239***	0.4626***	-0.404***	1																								
	1-5. l_trade	-0.0658*	-0.5684***	-0.7236***	0.1556***	1																							
	1-6. l_naturalresource	0.0252	0.0667*	0.0291	0.0416	-0.0683*	1																						
	1-7. institution	0.2558***	0.2208***	-0.1574***	0.4786***	0.0113	-0.0805*	1																					
	2-1. l_fdi								1																				
	2-2. l_gdp								0.718***	1																			
	2-3. l_population								0.0818	0.5967***	1																		
2. Korea	*2-4. l_gdpper*								0.6862***	0.3739***	-0.5186	1																	
	2-5. l_trade								-0.1748	-0.6971***	-0.727***	0.0987*	1																
	2-6. l_naturalresource								-0.1763***	-0.1321**	0.0387	-0.1912**	-0.1371**	1															
	2-7. institution								0.2072**	0.1823**	-0.1328**	0.3636***	0.0603	-0.057	1														

	1-1	*1-2*	*1-3*	*1-4*	*1-5*	*1-6*	*1-7*	*2-1*	*2-2*	*2-3*	*2-4*	*2-5*	*2-6*	*2-7*	*3-1*	*3-2*	*3-3*	*3-4*	*3-5*	*3-6*	*3-7*	*4-1*	*4-2*	*4-3*	*4-4*	*4-5*	*4-6*	*4-7*
3-1. l_fdi															1													
3. Japan																												
3-2. l_gdp															0.629***	1												
3-3. l_population															-0.065	0.564***	1											
3-4. l_gdpper															0.690***	0.255***	-0.632***	1										
3-5. l_trade															-0.129*	-0.728***	-0.716***	0.162**	1									
3-6. l_naturalresource															-0.015	-0.029	-0.024	-0.04	-0.170***	1								
3-7. institution															0.231***	0.190***	-0.215***	0.400***	-0.028	0.066	1							
4-1. l_fdi																						1						
4-2. l_gdp																						0.808***	1					
4-3. l_population																						0.229***	0.675***	1				
4-4. l_gdpper																						0.879***	0.681***	-0.032	1			
4-5. l_trade																						0.04	-0.437***	-0.772***	0.177***	1		
4-6. l_naturalresource																						0.121*	0.210***	0.104	0.111	-0.062	1	
4-7. institution																						0.445***	0.361***	-0.03	0.464***	0.083	-0.083	1

4.3.4 Three country result

<Table 5-1> All Country

Country: All Country				
Independent Variables : l_fdi	*Coef.*	*Std. Err*	*t-value*	*p-value*
Intercept	41.571**	17.607	2.36	0.019
l_gdp	1.650***	0.117	14.05	0.000
l_population	-3.811***	1.109	-3.44	0.001
l_trade	.629**	0.265	2.38	0.018
l_naturalresource	0.410***	0.114	3.60	0.001
institution	-.0018	0.033	-0.54	0.588
No. of observations		720		
R^2		0.428		

1) This table presents results from Fixed effect Model.
2) ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. All t-values are based on two-tailed tests using firm and year clustered standard errors.

This study has used the samples from Korea, Japan, and China by using a Fixed Effects Model. The coefficient for l_gdp was 1.650 which showed the to be the most significant independent variable that affects outward FDI (at the t-value being 14.05.) The independent variables l_trade and l_naturalresource showed a positive correlation with l_fdi at the 5% level and 1% level respectively. For l_population, it had a negative correlation with l_fdi at the 1% level with a coefficient of -3.811. In the case of institution, a negative correlation was

detected however, it did not show to be significant in affecting outward FDI. The R^2 of this model which is a statistical measure that shows how close the data are to the fitted regression line was 42.8%. This study will focus on showing the results of the regression on the determinants that affect foreign investment.

Table 5-2 All Country_GDPper

Country: All Country				
Independent Variables : l_fdi	*Coef.*	*Std. Err*	*t-value*	*p-value*
Intercept	3.368**	1.442	2.34	0.020
l_gdpper	1.491***	0.088	17.04	0.000
l_trade	1.106***	0.252	4.38	0.000
l_naturalresource	0.307***	0.093	3.29	0.001
institution	-0.015	0.030	-0.51	0.608
No. of observations		720		
R^2		0.333		

1) This table presents results from Fixed effect Model.
2) ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. All t-values are based on two-tailed tests using firm and year clustered standard errors.

This model with GDP per capita also used the samples from Korea, Japan, and China with the Fixed Effects Model. This study has used the samples from Korea, Japan, and China by using a Fixed Effects Model. The coefficient for l_gdpper was 1.491 which showed the to be the most significant independent variable that affects outward FDI (at the t-value being 17.04.) The independent variables l_trade and l_naturalresource showed a positive correlation with l_fdi at 1% level. In the case of institution, a negative correlation was detected however, it did not show to be significant in affecting outward FDI. The R^2 of

this model which is a statistical measure that shows how close the data are to the fitted regression line was 33.3%. This study will focus on showing the results of the regression on the determinants that affect foreign investment.

4.3.4.1 Korea result GDP

Table 6-1 Korea

Country: Korea				
Independent Variables : l_fdi	*Coef.*	*Std. Err*	*t-value*	*p-value*
Intercept	64.569**	31.721	2.04	0.043
l_gdp	1.664***	0.172	9.65	0.000
l_population	-5.019***	1.900	-2.64	0.009
l_trade	0.297*	0.438	0.68	0.4982
l_naturalresource	0.674***	0.222	3.03	0.003
institution	-0.028	0.053	-0.52	0.603
No. of observations	240			
R^2	0.487			

1) This table presents results from Fixed effect Model.
2) ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. All t-values are based on two-tailed tests using firm and year clustered standard errors.

Table 6-1 shows the results of Korea solely. The five independent variables were investigated to show whether they affect Outward FDI and whether the correlation is it positive or negative. For Korea, the results were the same to when all three countries were tested. l_gdp representing the market size of the

host country, have shown to have the most impact on the Korean firms investing in that host country with a coefficient of 1.664 at 1% level. l_naturalresource also had a positive correlation with outward FDI with a correlation of 0.674 at 1% level, showing that investment to the host country by Korea increases with the reserves of natural resources of the host country or according to how dependent the host country's economy is on natural resources. Then l_trade which can show the openness of the host country or how dependent the country is on global economy**,** had a great impact with a coefficient of 0.297 at 10% level. l_population has shown a negative correlation of -5.019 at the 1% level showing that FDI decreases when the population size of the host country is large. Institution which was used to measure the political stability(risk) or the quality of the society has shown a negative relationship with FDI however, the results were insignificant. This was the opposite form what was expected as this study expected a positive correlation where investment to host countries increased with more political stability. Thus GDP, trade, and natural resource is positively correlated to FDI while institution levels of the host country have a negative or neutral relationship.

4.3.4.2 Korea result GDP per

Table 6-2 Korea

Country: Korea				
Independent Variables : l_fdi	*Coef.*	*Std. Err*	*t-value*	*p-value*
Intercept	3.851	2.591	1.49	0.139
l_gdpper	1.569***	0.157	9.99	0.000
l_trade	0.847*	0.433	1.96	0.052
l_naturalresource	0.461**	0.191	2.41	0.017
institution	-0.051	0.054	-0.95	0.345
No. of observations	240			
R^2	0.287			

1) This table presents results from Fixed effect Model.
2) ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. All t-values are based on two-tailed tests using firm and year clustered standard errors.

After testing GDP as an independent variable representing the market size showed a positive correlation and population a negative correlation, the author wanted to testify they GDP per capita would show a positive correlation. The four independent variables were investigated to show whether they have an affect on Outward FDI whether it is positive or negative. For Korea, the results were the same to when all three countries were tested. L_gdpper representing

the purchasing power of the consumers, have shown to have the most impact on the Korean firms investing in that host country with a coefficient of 1.569 at 1% level. Then l_trade which can show the openness of the host country or how dependent the country is on global economy**,** had a great impact with a coefficient of 0.847 at 10% level. Ln_naturalresource also had a positive correlation with outward FDI with a correlation of 0.461 at 5% level, showing that investment to the host country by Korea increases with the reserves of natural resources of the host country or according to how dependent the host country's economy is on natural resources. Institution which was used to measure the political stability(risk) or the quality of the society has shown a negative relationship with FDI however, the results were insignificant. This was the opposite form what was expected as the author expected a positive correlation where investment to host countries increased with more political stability. Thus GDP per capita, trade, and natural resource is positively correlated to FDI while institution levels of the host country have a negative or neutral relationship.

4.3.5.1 Japan result

Table 7-1 Japan

Country: Japan				
Independent Variables : l_fdi	*Coef.*	*Std. Err*	*t-value*	*p-value*
Intercept	63.798*	33.823	1.89	0. 061
l_gdp	1.903***	0.216	8.80	0.000
l_population	-5.451*	2.089	-.261	0.010
l_trade	0.752*	0.425	1.77	0.078
l_naturalresource	0.695***	0.222	3.13	0.002
institution	-0.016	0.055	-0.29	0.770
No. of observations	240			
R^2	0.484			

1) This table presents results from Fixed effect Model.
2) ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. All t-values are based on two-tailed tests using firm and year clustered standard errors.

Table 7-1 shows the results tested with Japan data. Identical to Korea, five independent variables were examined to show their relationship with Outward FDI. Similarly, l_gdp has shown to have the largest impact on foreign investment by Japan to host countries with a coefficient of 1.903 at 1% level.

Then l_trade had a great impact with a coefficient of 0.752 at 10% level. Moreover, ln_naturalresource has a positive correlation with outward FDI of 0.695 at 1% level, meaning investment to the host country increases with the level of natural resource. However, population has shown a negative and significant correlation of -5.451 at the 10% level. Institution has shown a negative and insignificant relationship with FDI however the results were insignificant.

The coefficients of GDP and natural resource in Japan were strongly correlated as they were in the 1% significance level with R^2 at 48.4%. Thus GDP , trade, and natural resources are positively correlated to FDI while population is negatively related and institution levels of the host country have a negative relationship.

4.3.5.2 Japan result

Table 7-2 Japan

Country: Japan				
Independent Variables : l_fdi	*Coef.*	*Std. Err*	*t-value*	*p-value*
Intercept	3.955	2.400	1.65	0.101
l_gdpper	1.419***	0.171	8.29	0.000
l_trade	1.037***	0.383	2.71	0.007

l_naturalresource	0.614***	0.187	3.28	0.001
institution	-0.025	0.051	-0.49	0.626
No. of observations	240			
R^2	0.303			

1) This table presents results from Fixed effect Model.
2) ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. All t-values are based on two-tailed tests using firm and year clustered standard errors.

Table 7-2 shows the results of four independent variables that were examined to show what variables affect Outward FDI including GDP per capita, trade, natural resources and institution. GDP per capita was used in place of GDP and population to show that the purchasing power of the individual citizens of the host country affects the amount of investment. Similarly, l_gdpper has shown to have the largest impact on foreign investment by Japan to host countries with a coefficient of 1.419 at 1% level. Then l_trade had a great impact with a coefficient of 1.037 at 1% level. Moreover, ln_naturalresource has a positive correlation with outward FDI of 0.614 at 1% level, meaning investment to the host country increases with the level of natural resource. Institution has shown a negative and insignificant relationship with FDI.

The coefficients of GDP per capita, trade, and natural resource in Japan were strongly correlated as they were in the 1% significance level with R^2 at 30.3%.

Thus GDP per capita, trade, and natural resource is positively correlated to FDI while institution levels of the host country have a negative or neutral relationship.

4.3.6.1 China result

Table 8-1 China

Country: China				
Independent Variables : l_fdi	*Coef.*	*Std. Err*	*t-value*	*p-value*
Intercept	56.691**	24.586	2.31	0.022
l_gdp	1.472***	0.175	8.40	0.000
l-population	-4.503***	1.590	-2.83	0.005
l_trade	0.270**	0.467	1.65	0.100
l_naturalresource	0.170***	0.102	2.64	0. 009
institution	-0.006	0.050	-0.12	0.903
No. of observations	240			
R^2	0.400			

1) This table presents results from Fixed effect Model.
2) ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. All t-values are based on two-tailed tests using firm and year clustered standard errors.

Alike Korea and Japan, Chinese FDI has shown similar patterns with the five variables that were examined. From Table 8-1 we can see that similar to Korea and Japan, l_gdp was shown to have the largest positive effect on the investment to the host country with a coefficient of 1.472 1% level(with a t-value of 8.40). Then l_trade was shown to have the second largest impact on foreign investment with a positive coefficient of 0.270 at the 5% level. l_naturalresource has shown a positive significance at the 1% level with a correlation of 0.170. Population has shown a strong negative correlation of -4.503 at the 1% level showing that FDI decreases with a larger host population size. Institution levels, which was expected to have a negative correlation with FDI did have a negative correlation however, the result was insignificant unable to prove the relationship. The R^2 was 40.0% showing the fitness of this regression model.

4.3.6.2 China result

Table 8-2 China

Country: China				
Independent Variables : l_fdi	*Coef.*	*Std. Err*	*t-value*	*p-value*
Intercept	5.727**	2.707	2.12	0.036
l_gdpper	1.217***	0.143	8.52	0.000
l_trade	1.067**	0.486	2.19	0.029
l_naturalresource	0.170*	0.103	1.65	0.100
institution	-0.006	0.051	-0.12	0.903
No. of observations		240		
R^2		0.520		

1) This table presents results from Fixed effect Model.
2) ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively. All t-values are based on two-tailed tests using firm and year clustered standard errors.

Alike Korea and Japan, Chinese FDI also shows similar correlations with the four variables. From Table 8-2 we can see that similar to Korea and Japan, l_gdpper had shown to have the largest positive effect on the investment to the host country with a coefficient of 1.217 at 1% level(with a t-value of 8.52). Then l_trade was shown to have the second largest impact on foreign investment with a positive coefficient of 1.067 at the 1% level.

l_naturalresource has shown a positive significance at the 10% level. For the independent variable institution, which was expected to have a negative correlation with FDI did have a negative correlation however, the result was insignificant unable to prove the relationship.

The R^2 was 52.0% showing fitness of the regression model.

4.4 Significance of Study

This study has looked into two different regressions using the fixed effects model to identify the characteristics of the host country that determine Outward FDI. Three East Asian countries Korea, Japan, and China were expected to show similar patterns when investing abroad. This study was able to verify that the three countries are attracted to host countries with similar features. They are all attracted to countries with a large GDP, natural resource deposit, trade, and GDP per capita. In addition, they have a tendency of investing in host countries that have a smaller population size.

This study also tested whether the institutional level of the host country is related to the amount of investment being made, however, the results have shown insignificant values. This shows that the three countries' investment quantity cannot be determined by the political stability of the host country.

In this study, 5 variables including GDP, population, trade, natural resources, and

institution were examined to see whether the investment of the three countries had a correlation with Outward FDI. GDP accounts for the size of the economy or market showing that larger economies attract more investment along with trade and natural resource endowments. The study indicated that larger the population, less attractive the host country was, which led on testing the second model.

The second regression model tested 4 variables which were GDP per capita, trade, natural resources, and institution. In the place of GDP and population, GDP per capita was used to show the purchasing power of the individuals of the host country. GDP per capita naturally had a positive correlation as GDP and population had a positive and negative correlation respectively. Thus, by examining GDP per capita and three other variables, this study was able to show the determinants of the host country in which FDI was attracted to.

Chapter 5. Conclusion

This study has focused on the determinants of OFDI in three East Asian countries which are Korea, Japan, and China. Data collected from looked into 2 different regressions using the fixed effects model to identify the characteristics of Outward investment made by the three countries. Other than their location the three countries share similar cultures and growth patterns so this study tried to identify whether they shared similar investment patterns as well. However, considering the Chinese economy, the institution determinant was tested to show if the difference in economy affects the investment patterns.

For this study, data from the years 2002 to 2012 of a total of 11 years and ran a regression on the top 20 countries for Korea, Japan, and China respectively according to the sum of total amount of outward FDI of those eleven years took up approximately 84% of the total OFDI. There were 2 models tested to identify the determinants of OFDI. The first model tested GDP, population, trade, natural resources, and institution against OFDI. Then the second model looked into GDP per capita, trade, natural resources, and institution.

Hypotheses 1 to 5 have shown significant and conforming results to what was anticipated. Outward FDI has a positive relationship with GDP for all 3 countries, showing that the market size can affect the amount of investment made.

Population was shown to have a negative correlation for all three nations. Next, all three nations were attracted to countries that have larger trade volumes. Moreover, natural resources has shown positive correlations for all three countries. However, institution was not able to show significant results indicating that the institutional level of a host country does not determine the volume of investment that is made by the three countries.

This shows that the level of GDP, population, GDP per capita, trade, and natural resource of the host country determines the size of the investment made by the 3 countries. All three countries have shown similar results, meaning their investment patterns are also somewhat similar. However, institution levels did not show significant results for all three countries.

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Appendix

Annex1

Top 20 countries Korea

Rank	Country
1	China
2	United States
3	Hong Kong
4	United Kingdom
5	Viet Nam
6	Netherlands
7	Australia
8	Canada
9	Indonesia
10	Brazil
11	Malaysia
12	Singapore
13	Germany
14	India
15	Russian Federation
16	Japan
17	Philippines
18	Kazakhstan
19	Slovakia
20	Ireland

Annex2

Top 20 countries Japan

Rank	Country
1	United States
2	China
3	Netherlands
4	United Kingdom
5	Australia
6	Brazil
7	Thailand
8	India
9	Korea, Republic of
10	Singapore
11	Hong Kong

12	Denmark
13	Germany
14	Indonesia
15	Canada
16	France
17	Malaysia
18	Viet Nam
19	Philippines
20	Luxembourg

Annex3

Top 20 countries China

Rank	**Country**
1	United States
2	Hong Kong
3	Australia
4	Singapore
5	United States
6	Luxembourg
7	United Kingdom
8	Kazakhstan
9	Canada
10	Russian Federation
11	France
12	Indonesia
13	Germany
14	Myanmar
15	Mongolia
16	Cambodia
17	Lao People's Dem. Rep.
18	Iran, Islamic Republic of
19	Pakistan
20	Venezuela, Bolivarian Rep. of

Annex4
STATA result for F-test

corr(u_i, Xb) = -0.6291 Prob > F = 0.0000

l_fdi	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l_gdpper	1.491188	.087521	17.04	0.000	1.319302	1.663074
l_trade	1.106123	.2524926	4.38	0.000	.6102434	1.602003
l_naturalresource	.3069862	.0933408	3.29	0.001	.1236705	.4903018
institution	-.0152808	.0297824	-0.51	0.608	-.0737715	.0432099
_cons	3.368315	1.442167	2.34	0.020	.5359877	6.200643
sigma_u	2.1136017					
sigma_e	.65785906					
rho	.91167948	(fraction of variance due to u_i)				

F test that all u_i=0: F(59, 598) = 39.06 Prob > F = 0.0000

Annex5
STATA result for LM test

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        l_fdi[country_new,t] = Xb + u[country_new] + e[country_new,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                 --------+------------------------------
                   l_fdi |   4.599078       2.144546
                       e |   .4327785       .6578591
                       u |   1.699525       1.303658

        Test:   Var(u) = 0
                                 chibar2(01) =   1552.39
                              Prob > chibar2 =    0.0000
```

Annex6
STATA result for Hausman test

```
. hausman fe re

                ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re         Difference          S.E.
-------------+----------------------------------------------------------------
    l_gdpper |   1.491188     1.423128        .0680608        .0544979
     l_trade |   1.106123     .2760856        .8300378        .1861975
l_naturalr~e |   .3069862      .130817        .1761692        .0783501
 institution |  -.0152808     .0037888       -.0190696               .
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       55.89
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)
```

국문초록

권후나

국제학과 국제통상전공

국제대학원

서울대학교

세계화가 진행됨에 따라 국제경제에서 무역에 더불어 해외투자의 중요성이 커지고 있다. 아시아에 위치하고 유사한 경제성장 모습을 보인 세 국가 한국, 일본, 중국이 해외에 투자를 할 때 어떤 요인들에 영향을 받는지 알아보았다. STATA 통계프로그램을 이용해 11년간의 데이터를 이용해 패널 회귀분석을 실시했다. 독립변수로 GDP, 1인당 GDP, 인구, 무역량, 자연자원, 정치부패지수를 이용했다. 해외투자 대상국의 어떤 특징들이 한중일로 하여금 투자를 더 많이 혹은 적게 하는지 검증했다. 세 국가는 위의 요인들에 있어 유사한 상관관계를 보였다.

주제어: 해외직접투자, 투자요인, 실증분석, 아시아경제